

WHAT IS CLAIMED IS:

1. An energy saving shade system for residential dwelling windows having a window pane and a rectangular frame defined by top, side, and sill surfaces, the frame having dimensions that vary within a range of frame widths and a range of frame heights, the shade system comprising:

a pair of end caps, each having a side wall, a top wall, a front wall, and a back wall, the top, front and back walls projecting in a normal direction from the side wall, at least the front wall so projecting by at least one half the range of frame widths, each of the pair of end caps being insertable in sealing relation against the top surface and one of the side surfaces of the frame;

a pair of side rails, each having a cross-section to provide a base securable in sealing relation to the respective side surfaces of the frame, and a pair of generally parallel walls projecting from the base by at least one half the range of frame widths to define at least one channel opening to face inwardly of the respective side surfaces of the frame, the side rails having lengths adjustable through the range of frame heights and to extend between sill and the end caps;

a pair of shade supporting plates receivable in the respective end caps, each of the shade supporting plates being laterally adjustable throughout approximately one half the range of frame widths;

an impermeable, transparent shade of a width within the range of frame widths, the transparent shade having a top portion connected to and wound on a roller mountable between the shade supporting plates, and a bottom end extendible for the range of frame heights from the roller to the sill;

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a pair of edge seals supported within the at least one channel of the respective side rails, and for slidably engaging and retaining opposite sides of the shade member in spaced relation to the window pane;

means for sealing the transparent shade and the top surface of the rectangular frame; and

means for sealing the distal end of the transparent shade and the sill.

2. The shade system of claim 1 comprising a valance to extend between the end caps, the valance having a length to overlie at least a portion of the front walls of the end caps in the widest of the range of frame widths and not exceeding the narrowest of the range of frame widths.

3. The shade system of claim 1, wherein the means for sealing the transparent shade and the top surface of the rectangular frame comprises a deep pile strip securable to the top surface of the frame and engageable with the wound top portion of the transparent shade.

4. The shade system of claim 1, further comprising a thermal insulating shade of a width within the range of frame widths, and having top, bottom, and side edge portions, the top portion of the thermal insulating shade being connected to a second roller mountable between the shade supporting plates, and being wound on the second roller in a retracted condition, the bottom portion of the thermal insulating shade being extendable from the second roller to the sill surface of the rectangular frame to position the thermal insulating shade in substantially parallel spaced relation to the transparent shade.

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5. The shade system of claim 4, wherein the side rails each have an E-shaped cross-section to provide the base securable in sealing relation to the respective side surfaces of the frame, a pair of generally parallel outer walls projecting from the base, and a central wall projecting from the base in generally parallel relation to and defining with the outer walls, inner and outer channels opening to face inwardly of the respective side surfaces of the frame

6. The shade system of claim 5, wherein the transparent shade is drawn through the outer channel and the thermally insulating shade is drawn through the inner channel.

7. The shade system of claim 5, wherein each of the inner and outer channels has a channel depth in a direction parallel to the outer and central walls of the respective side rails, and a channel width normal to the channel depth, each of the channels having a guide portion extending from the base by at least one half the range of frame widths, and a sealing portion extending from the guide portion.

8. The shade system of claim 7, wherein the channel width of the guide portion is greater than the channel width of the sealing portion.

9. The shade system of claim 8, wherein each of the transparent shade and the thermal insulating shade includes a pair of guide blocks, one on each of opposite sides of the respective shades, the guide blocks having a width dimension greater than the channel width of the sealing portion of the respective inner and outer channels.

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10. The shade system of claim 9, wherein the guide blocks are secured to opposite ends of a batten fixed to and extending across the bottom edge portion of the respective transparent and thermal insulating shades.

11. The shade system of claim 10, wherein the guide blocks each have a depth dimension and the guide portion of each of the inner and outer channels extends from the base by at least one half the range of frame widths plus the depth dimension of each guide block.

12. The shade system of claim 7, including deep pile sealing strips on opposite sides of the sealing portion of the respective channels.

13. The shade system of claim 1, including a pair of side rail footers securable to the sill, each of the side rail footers and the respective side rails being telescopically adjustable through the range of frame heights.

14. The shade system of claim 5, including a pair of side rail footers securable to the sill, each of the side rail footers and the respective side rails being telescopically adjustable through the range of frame heights.

15. The shade system of claim 14, wherein the central wall of each side rail has a bifurcated inner edge, and wherein each footer has an upstanding post receivable in the bifurcated edge of the central wall.

16. The shade system of claim 1, including a pair of springs, each for biasing one of the pair of shade supporting plates to a position spaced from the side wall of one of the pair of end caps by at least one half the range of frame widths.

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17. The shade system of claim 16, wherein each of the pair of springs is fixed at opposite ends to a shade supporting plate and to an end caps, thereby to provide a pair of end cap/supporting plate units.

18. The shade system of claim 16, wherein each of the pair of springs includes conical spring-wire convolutions, thereby to be contractible to a width of one spring-wire convolution.

19. The shade system of claim 1, wherein the side and top walls of each of the end caps includes a pressure sensitive adhesive for securing each of the end caps to the side and top surfaces of the frame.

20. The shade system of claim 1, wherein the base of each of the side rails includes a pressure sensitive adhesive for securing each of the side rails to the side surfaces of the frame.

21. The shade system of claim 1, wherein the means for sealing the distal end of the transparent shade and the sill comprises a foam strip secured to the bottom end of the transparent shade.

22. The shade system of claim 21, including a hem along the bottom end of the transparent shade, a batten in the hem, and a channel-shaped clip overlying the hem and the batten, the foam strip being adhesively secured to the channel-shaped clip.

23. The shade system of claim 1, wherein the transparent shade is treated with an ultraviolet inhibitor.

24. The shade system of claim 23, wherein the transparent shade is a first transparent shade, and including a second transparent shade treated with a

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reflective solar tint, the second transparent shade being storable between the supporting plates and being interchangeable with the first transparent shade.

25. The shade system of claim 4, wherein the transparent shade is a polyester film treated with an ultraviolet inhibitor and the thermal insulating shade includes bonded layers including a decorative inner layer, an insulating fabric, and air tight layer, and a light filtering outer layer.

26. The shade system of claim 25, wherein the transparent shade is a first transparent shade, and including a second transparent shade formed of a polyester film treated with a reflective solar tint, the second transparent shade being storable between the supporting plates with the first transparent shade and the thermal insulating shade, and being interchangeable with the first transparent shade.

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